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THE ENERGY SITUATION IN JAPAN

Summary

The major trends in Japan's energy situation have remained the same since JEI's previous energy report (JEI Report No. 18A, May 7, 1982). Crude oil imports continued to decline. Alternative energy supplies, particularly nuclear energy, showed steady increases. Industry's energy conservation efforts have also been kept up. While the generally sluggish economy helped contain consumption, the declining level of imports has also started to create problems by resulting in a tax revenue drop that might have a substantial impact on the funding of alternative energy projects.

This paper will examine last year's trends, the impact of the latest decision by OPEC on price and production, the Japanese government's energy policy for FY 1983 (April 1, 1983 - March 31, 1984) and the major areas of U.S.-Japan interaction on energy issues.

Overview

1982 Consumption — Last year, Japan imported 215 million kiloliters of crude oil, a 7-percent decline from 1981, making it the third consecutive year that oil imports declined. After the second oil crisis in 1979, the benchmark price of $12.70 per barrel doubled in one year and then kept rising until it reached $34 per barrel last year. Japan and other industrially advanced nations responded by attempting to import less oil, and have been able to lower oil consumption, thanks to conservation, stockpiling and generally depressed economic conditions. In case of Japan, the steel, cement and ceramic industries' switch from oil to coal played a major role in conservation. In addition, the government launched a public relations campaign to heighten the nation's awareness of energy conservation. Government and industry also cooperated in designing energy saving products, an effort that was particularly successful with electric appliances and automobiles.

While the use of heavy oil by industry declined, consumption of various light fuels either increased or stabilized. A drastic decline was seen in naphtha, a material used in most petrochemical products. The decline in naphtha consumption resulted in profit losses for refineries already plagued by excessive inventory, competition from abroad and what the government calls "weak business structure."

In the case of other energy sources, coal imports in 1982 were 77.8 million tons, slightly down from the previous year. Domestic production was expected to stay at the same level as in 1981, at slightly more than 17 million tons. Imports of liquefied natural gas (LNG) since 1980 have steadily and slowly increased to reach a present level of 16 million tons (see Tables 1, 2 and 3).

Changing Structure — The structure of Japan's energy supply was the subject of a 1980 OECD study. The basic structure remained the same in 1982. According to the study, Japan's primary energy sources consisted of crude oil, LNG and petrochemical products (64 percent), coal (17.8 percent), natural gas (5.8 percent), nuclear energy (5.4 percent) and hydro and geothermal energies (6.2 percent). In comparison, the United States' primary energy sources came from oil, LNG and petrochemical products (43.4 percent), coal (22.4 percent), natural gas (26.6 percent), nuclear energy (3.6 percent) and hydro and geothermal energies (4 percent). Thus, relative to the United States, Japan was more dependent on petroleum and less dependent on coal. Japan's consumption of energy in terms of oil equivalent in that year was 372 million tons, while the United States used 1,809 million tons.

One of the major changes since 1980 in structure of Japan's energy use has come in the generation of electricity. While oil is still the most important source of electricity, the use of nuclear energy is steadily increasing. In 1980 about 70 percent of electricity was generated by thermo power, mostly oil derived, while 14 percent came from nuclear energy and 16 percent from hydro power. In the first six months of 1982, according to the Japan Atomic Power Industry News, nuclear energy generated 23 percent of the total electric supply, surpassing hydro power. Last year, 25 nuclear plants together generated more than 100 billion kilowatt-hours for the first time. The capacity utilization rate reached 70 percent, the highest ever achieved in Japanese nuclear plant operation.

OPEC London Meeting

In spite of efforts to lower oil consumption and develop alternative energy resources, Japan will be dependent on imported oil in the foreseeable future. Therefore, the Japanese closely followed the outcome of the OPEC meeting in London last month. The resulting announcement that the official Saudi Arabian light oil price will be lowered from $34 to $29 per barrel and that the maximum production ceiling will be set at 17.5 million barrels per day sparked conflicting projections about the future.

There are several schools of thought on what the impact of this momentous change in OPEC pricing will be for Japan. None of the Japanese forecasters and analysts believe that the $29 per barrel price can be maintained, considering OPEC's declining control of the market and the increased number of spot market deals. One view holds that the price will soon go down to about $25 per barrel and then stabilize.[1] Eventual stabilization is supported by factors ranging from the political nature of oil and the expected rise in consumption due to economic recovery to a continued subordinate role for alternative energy resources in this century. On the other hand, holders of a second view point out

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it is quite possible that the prices will fall below $25. They feel, however, that the further the price declines, the steeper the next price hike will be — predicting instability and sudden disruption in the market rather than stabilization.[2] They feel that the volatility will stem from OPEC's declining control over production and prices. Oil industry representatives have put forth another possibility, believing that the present oil glut will continue for at least the next five to seven years. They feel that even if the nominal oil price turns up again, the increases will be gradual which will keep the supply and demand relationship stabilized.[3] Some leading energy research centers in Tokyo in yet another view caution that if the lower price holds, demand will pick up in the mid-1980s. It is then possible that a third oil crisis will occur sometime in the late 1980s or early 1990s.

The Japanese believe that OPEC's leading member, Saudi Arabia, has one goal — to raise the oil price only through gradual increases. The Japanese also are confident that as long as the price changes occur gradually, they can manage their economy. They hope a sudden disruption resulting either from conflict within OPEC or a shift in supply and demand can be avoided, but as shown above by the diversity of views, there is no concensus on whether disruption and price volatility can be avoided.

The Reverse Shock — Prior to the London meeting, there was lively debate in Japan on the "reverse oil shock" — the negative impact of the oil price cut. Some economists argued that if the price was cut it would mean declines in revenue for the oil producing countries. This in turn would shrink their imports and hurt Japanese trade. They were also concerned that a cut in revenue might lead to sudden changes in the oil producing countries' foreign investment policies, changes which might disrupt international financial markets and threaten Japanese large-scale plant exports to the Middle East.

Those who welcomed the price cut argued that since Japan pays about $45 billion a year for imported oil, the price cut will have an immediate favorable impact on the balance of payments. Domestically, the cut would have a favorable impact on inflation. If prices remain stable at a lower level, and exports expand, it would also have a favorable impact on the appreciation of the yen. It is not yet clear which group of economists will be correct.

After OPEC announced its price cut, the Japanese government immediately released its own projection of the impact on the Japanese economy. The Economic Planning Agency believes that, given a $5 per barrel cut, real (inflation-adjusted) economic growth will increase by 0.3 percentage points in the first year and 0.8 percentage points in the second year while consumer prices will be down by 1 percentage point. Nihon Keizai Shimbun has a slightly different projection, with a 0.4 percentage point increase in real growth, a 0.4 percentage point decline in consumer prices and a more than 10 percent price cut for petrochemical products.

The short-run impact on specific sectors will not be dramatic since it takes months for some industries to feel the impact. The immediate beneficiaries will be the oil refineries, which according to one estimate might be able to cut costs by ¥1.5 billion ($6.3 billion at current exchange rates) per year.[4] Several industries, including shipping, might benefit, but exporting industries such as automobiles and electronics would experience a small decline in sales to the oil producing countries. The steel industry has already invested in energy saving technologies, so that the impact of lower oil prices will be minimal. All projections, however, assume that oil prices will be stable or only gradually shift downward, an uncertain assumption at best.

OPEC's Future — Analyses of OPEC's declining power are already abundant. This trend became apparent over the last two years, as the share of spot market oil increased

from the customary 5 percent to 30 or 40 percent of total transactions. Specialists point to the historically volatile nature of the oil market; it is a market that has traditionally been stabilized by cartels or monopolies, first by Standard Oil, then by a coalition of major European and American oil firms, and finally by OPEC. The majors' control was clearly diminished with the rise of OPEC's power, but they are now likely to regain their foothold to some extent. One report suggested that when refinery facilities are completed in the Caribbean and Singapore that can handle crude oil with a higher wax content, the four American majors, Exxon, Mobil, Texaco and Standard Oil of California might force down the price of high quality oils from the North Sea, Northern Africa and Nigeria.[5]

In conclusion, Japan will have to cope with two outcomes of the recent developments in the oil market. As the second largest oil importer (only the United States imports more), Japan's continued trade deficit with the Middle East will improve substantially. In 1981, the United States imported 4.4 million barrels per day, while Japan imported 3.9 million barrels, with Japan's resulting trade deficit with the Middle East reaching $25 billion.[6] In this regard, Japan will clearly benefit from the price cut. On the other hand, as a major exporter of goods and technology to OPEC, the loss of foreign exchange earnings resulting from the price and production cut will have significant repercussions on long-term industrial plans in the OPEC countries. Saudi Arabia's sudden cancellation without explanation of a ¥200 billion ($840 million) water purifying project immediately after the London meeting was perceived in Japan to be a direct result of the price cut.

Government Policy

The Japanese government has built its energy policy around the assumptions first contained in its 1979 long-term energy supply and demand projections. Policymakers and energy specialists in Japan have been cautious in their expectations, generally holding a view that Japan should continue to push for conservation, diversify its oil supply sources, develop alternative sources of energy and increase its oil stockpiles. While this view still prevails, the government has had to revise its predictions about the future and reconsider its policy options in light of OPEC's actions.

With the new situation arising from OPEC's decision, the Ministry of International Trade and Industry (MITI) recently decided to revise its long-term energy supply and demand projections announced last April (see Table 4). The assumption at that time was that Japan would continue to achieve a 5-percent real GNP growth throughout the 1990s. This has since proved to be unrealistically high, and the new round of revisions will mark the third time since 1979 that the government has revised energy projections downward. Last year's revisions estimated that between 1980 and 1990, dependence on oil in total energy demand would go down from 66.4 percent to 49.1 percent, while coal would rise from 16.7 percent to 19.5 percent, natural gas from 6 percent to 11.5 percent and nuclear energy from 5 percent to 11.3 percent. Total energy supply was estimated in oil equivalent at 590 million kiloliters per year in 1990.

The 1983 revision will focus on how much further oil dependence can be cut, the speed with which the cut will take place and how to proceed with alternative energy resource development. Declining oil prices act as a disincentive to oil conservation and alternative energy projects. Nevertheless, MITI's preliminary estimate of total energy supply in 1990 is 520 million kiloliters of oil equivalent, down from 590 million kiloliters in the previous forecast because of a reduction of the GNP growth forecast from 5 percent to 4 percent. Final revised estimates will be hammered out by the ministry's advisory group, the Comprehensive Energy Research Council, by August.

In addition to revising its projections, MITI reportedly is looking into a new energy policy which might include a cut in utility rates, new methods to deal with the oil tax revenue shortage and help for the troubled petrochemical and utility industries. MITI will also have to find new ways to finance alternative energy projects as part of any new energy policy. Nihon Keizai Shimbun estimated that the $5 per barrel cut might lead to a tax revenue reduction of ¥40 to ¥50 billion. This would directly affect alternative energy projects, since most of the oil tax revenue is used to finance government assistance to these projects.

The FY 1983 budget for energy clearly reflects the priority the Japanese government places on energy issues. While expenditures for most budget entries were either frozen or cut from last year, MITI's energy budget received a substantial increase.[7] MITI and its branch agency, the Agency for Natural Resources and Energy, play a central role in energy policy. About half of MITI's general account expenditures is taken up by the Special Account for Coal, Oil and Alternative Energy Development.

The first account is funded by revenue from various oil taxes. In FY 1983, 99 percent of oil tax revenue will go into this account. In FY 1983, this account is expected to have ¥581.4 billion ($2.4 billion), a 7-percent increase from the previous fiscal year. The money will go toward independent oil exploration abroad by the Japan National Oil Corporation, financial assistance to the private sector's oil stockpile programs, construction of facilities to hold government stockpiles and various types of assistance to develop technology for alternative energy resources such as coal liquefaction, alcohol fuels, solar energy and coal mining.

Another special account, the Special Account for Promotion of Electric Power Generation, is funded by utility taxes and is used to develop energy sources for generating electric power, particulary nuclear energy, and for the changeover from oil to coal. More specifically, various types of government assistance for developing nuclear fuel recycling, reprocessing and uranium enrichment technologies will be provided.

MITI is not the only agency that finances nuclear energy research. While MITI is in charge of commercial nuclear energy policy, the Science and Technology Agency uses part of its budget for such research as the development of fast breeder reactors and safety measures. To a smaller degree, the Ministry of Education and the Foreign Ministry are also involved in nuclear energy issues.

U.S.-Japan Energy Relations

U.S.-Japan energy relations centered around two issues in the past year: nuclear fuel reprocessing and Alaskan oil. Nuclear fuel reprocessing was the more volatile of the two issues.

Japanese and American officials have been meeting frequently since last fall to reach an agreement on Japan's reprocessing of spent nuclear fuel. The Carter administration's strict policy on nuclear non-proliferation undermined Japanese attempts to proceed with domestic recycling, and the Tokaimura reprocessing plant was allowed to operate only after prolonged and heated negotiations and strict conditions on the amount of spent fuel to be reprocessed and the period of operation. The Reagan administration extended the Tokaimura operation period until 1984. Japan has been sending spent nuclear fuel to Western Europe for reprocessing, but hopes to reduce its dependence on foreign reprocessor operations. The Tokaimura plant is Japan's first experimental reprocessing facility to help achieve this goal.

In the present bilateral agreement, the United States provides enriched uranium to Japan and imposes various approval requirements on the use of the material. If reprocessing is done in Japan, both sides must agree. U.S. approval is also required when shipping the spent fuel abroad for reprocessing. Without amending the existing agreement, Japan is pushing for a blanket approval system for reprocessing, similar to the agreements Japan has already concluded with Australia and Canada. The U.S. side reportedly is searching for ways to harmonize the existing nuclear non-proliferation law passed during the Carter administration and the present administration's favorable attitude toward reprocessing and fast breeder reactor development by countries which are not perceived as likely to violate non-proliferation principles.

In another nuclear energy issue, both governments signed an agreement in January at a summit meeting to conduct joint nuclear fusion research as a part of the 1979 agreement on energy research cooperation. The program will cover a wide range of projects and involve academic institutions in both countries along with the support of MITI, the Science and Technology Agency, the Education Ministry and the U.S. Department of Energy.

Other exchanges of views between the United States and Japan have taken place this year. Another January meeting between American and Japanese legislators in Tokyo focused on nuclear waste and alternative energy development. At the private sector level, a meeting between American and Japanese utility company executives was held in Tokyo for the first time at the end of February to discuss problems and prospects for their industry. According to Gaishi Hiraiwa, chairman of the Utility Industry Association, both sides recognized the existence of common problems ranging from stagnant demand, profit losses and the high cost of nuclear energy development.

The issue of exporting Alaskan oil to Japan was also brought up during the summit meeting in January. Since then, both proponents and opponents of the issue in the Congress have been debating the merit of amending the Export Administration Act to lift ban on exporting Alaskan oil.[8] Because the ban applies only to oil, though, Alaska has been exporting LNG to Japan at the level of 960,000 metric tons a year since 1969. Japanese interest in the Alaskan oil mainly arises from its desire to diversify oil supplies. Interior Secretary James Watt has also raised the possibility of large-scale Japanese investment in Alaskan coal mining, but so far the Japanese government has reacted cautiously.

Footnotes

[1]Kaoru Hiroe and Teruhiko Mano, "Reverse Oil Shock is Good for Japan," Mainichi Economist, March 1, 1983, pp. 10-18.

[2]Kotaro Seki, "Future of Crude Oil Price," Mainichi Economist, April 5, 1983, pp. 39-45.

[3]"OPEC's Next Defense Line," Toyo Keizai, March 26, 1983, pp. 22-27.

[4]Shuji Yamamoto, "The Impact of Crude Price Cut on Industry," Mainichi Economist, April 5, 1983, pp. 46-50.

[5]"OPEC's Next Defense Line."

[6]Japan 1982: An International Comparison.

[7]Shinichiro Ota, Kozo Oikawa, Toshiaki Kitamura and Kaoru Nakamura, "Highlights of MITI Policy in FY 1983," MITI Journal, March 1983, pp. 82-95.

[8]See JEI Report No. 7B, February 25, 1983, "Debate on Lifting Ban on Domestic Oil Exports Revised" and JEI Report No. 10A, March 18, 1983, "Roundtable Discussion on Reagan Administration Policy toward Japan."

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Table 1: Japan's Crude Oil Supply

(in thousands of kiloliters)

	1980	1981	1982
Domestic Production	503	456	422*
Imports	256,833	230,239	214,643
Import Percentage Change from Previous Year	91.6%	89.6%	93.2%

*January-November only.

Table 2: Japan's Coal Supply

(in thousands of metric tons)

	1980	1981	1982
Domestic Production	18,027	17,687	16,129*
Imports	68,570	77,959	77,813

*January-November only.

Table 3: Japan's Liquefied Natural Gas Imports

(in thousands of metric tons)

	1980	1981	1982*
Imports	16,324	16,833	16,043
Sales by Sector			
Industrial Use	591	565	512
Urban Household Use	3,180	3,411	3,208
Electric Power Generation	12,554	12,857	12,323

*January-November only.

Source for Tables 1, 2 and 3: Ministry of International Trade and Industry (MITI), Energy Production Supply and Demand Statistical Monthly, November 1982; and MITI Gazette, January 28 and February 12, 1983.

Table 4: Ministry of International Trade and Industry's Revised Estimates of Japan's Long-Term Energy Supply and Demand

	FY 1980 (actual)	FY 1990 (projected)	FY 2000 (projected)
Total Supply	430 m.kl.	590 m.kl.	770 m.kl.
Coal	16.7%	19.5%	190.0%
Nuclear Power	5.0	11.3	18.0
Natural Gas	6.0	11.5	9.0
Hydroelectric Power	5.6	5.0	5.0
Geothermal	0.1	1.0	11.0
New Energy Sources	0.2	2.5	
Oil	66.4	49.1	38.0

m.kl. = million kiloliters oil equivalent

Note: These estimates reflect revisions in MITI's initial April 1979 forecast of Japan's long-term energy supply and demand.

Source: Ministry of International Trade and Industry, Comprehensive Energy Research Council

Table 5: Japan's Leading Oil Suppliers

	FY 1979	FY 1980	FY 1981
Oil Majors	51.9%	44.5%	44.8%
Caltex Petroleum Corp. (USA)*	15.3	16.1	16.8
Exxon Corp. (USA)	11.1	9.8	9.3
Mobil Corp. (USA)	8.3	9.0	10.3
Royal Dutch/Shell Group (Netherlands, UK)	9.6	8.3	5.6
Compagnie Francaise des Petroles (CFP) (France)	1.3	0.9	1.0
Gulf Oil Co. (USA)	4.2	0.3	1.2
British Petroleum Group (UK)	2.1	0.1	0.5
Independents	2.4	3.3	3.4
Direct Government Sales	37.2	44.4	45.0
Japanese Development Companies	8.5	7.8	6.8
Total	100.0	100.0	100.0

*Caltex Petroleum Corp. is a 50-50 joint venture between Standard Oil Co. of California and Texaco, Inc.

Source: Keizai Koho Center, Japan 1982: An International Comparison